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COMPARATIVE SOCIOLOGY 15 (2016) 439-484

COMPARATIVE SOCIOLOGY

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Which Religions Still Affect Schooling? A Study of 143 Countries

Horst Feldmann
Department of Economics, University of Bath, Bath, UK
h.feldmann@bath.ac.uk

Abstract

This paper studies which world religions have exerted a contemporary influence on the extent of secondary schooling at the national level in the recent past. Using data on 143 countries and the period 1973 to 2012, it finds that both Hinduism and Judaism have a large positive effect, particularly among females. The group of other Eastern religions (which covers comparatively small religions, notably Confucianism) also has a positive effect, though it is slightly smaller, especially among girls. Islam has a negative effect, which is larger among females than among males. Neither Buddhism nor the three branches of Christianity – Eastern Orthodoxy, Roman Catholicism and Protestantism – have any statistically significant effect. The results are robust to numerous controls and variations in specification.

Keywords

education – religion – schooling

1 Introduction and Background

Using data on 143 countries, this paper econometrically studies which world religions have affected the extent of secondary schooling at the national level in the recent past – specifically, over the period from 1973 to 2012. It focuses not on any historical legacy world religions might have left in today's education but on their contemporary influence. Traditionally, education has played a key role in most world religions. These religions have shaped education since ancient times. Well-known examples are Confucianism, Judaism and

 | DOI 10.1163/15691330-12341394

Protestantism. Confucius considered education to be the most important task in society.[1] His teaching focused on moral principles and traditional knowledge. His core moral principles were (To 1993, Sun-keung Pang 2011): *ren*, which signifies humaneness, supreme moral achievement and excellence in character; *chung*, which means doing one's best in discharging one's duties; *yi*, which can be translated as moral rightness and appropriateness; and *li*, which represents the norms, etiquettes and protocols in both daily and institutional life. Confucius' main intention was to educate individuals of outstanding virtue who would assist the emperor in governing with integrity. His teaching of traditional knowledge aimed at maintaining cultural continuity and social stability (Ornstein et al. 2013). Apart from ethics, instruction included reading, writing, arithmetic, music, language, politics and literature (To 1993). Confucius made his students work hard and examined them rigorously. He thought that schooling should be made available to all young people who were motivated to learn, no matter what their background or status (Lee 2000). Indeed, his students came from the lowest as well as from the highest levels of society (Ho 1959). In this way, he founded a long tradition of education in China as well as in other East Asian countries such as Japan and Korea (To 1993, Yang 1993, Lee 2000). However, because women could not hold civil service positions, education for girls remained very limited for centuries (Kelleher 1987).

Jews are often known as "The People of the Book" (Miller et al. 2011). The Torah is replete with dicta to "teach your children diligently" about Jewish mores and history (Zeldin 2011). After the Romans had crushed the Jews' Great Revolt in 70 AD, a formal school system was initiated (Botticini and Eckstein 2012). In face of exile and loss of independence, education was charged with the responsibility for the continued existence of Judaism and the unity of the Jewish people (Iram 1993). Schooling of boys was made compulsory (Brickman 2008). Until the late 18th century, girls received no formal education and the curriculum was strictly religious (Carmody 1987, King 1987). Secular subjects were mostly excluded. Jewish communities ran their own schools, which were often attached to synagogues. Teaching was in Jewish languages only (Alexander and Glick 2003).

From the beginning of the Reformation, Protestantism has stressed the need for education too. Its founder, Martin Luther, demanded compulsory elementary schooling for both boys and girls of all social classes (Bowen 1975, Boyd

1 Although it does not have gods or deities, Confucianism has achieved a status equal to that of major religions in human history, due to its elaborate system of ideals and moral codes (To 1993, Sun 2013).

and King 1975). The best students should progress to secondary school. Schools should be run by the state. Luther advocated not only religious but also secular and vocational education (Harran 1997). In his view, children needed not only to be enabled to read the Bible, they also needed to be prepared to become orderly and productive citizens (Bowen 1975). From the 16th century throughout the Protestant states of Germany as well as in other countries that had broken away from Rome, numerous schools were founded on the model developed by Luther and his co-reformer Philip Melanchthon (Strauss 1978, Bowen 1975, 1981, Green 1979). Universities, too, were reformed and founded along Reformist lines (Paulsen 1908, Holborn 1959). Until the 18th century, Protestant Germany was the European leader in educational theory and practice (Hans 1967, Boyd and King 1975, Mitchell 1993).

What is less well-known is that traditionally education has played an important role in some other world religions as well and that these religions have also shaped educational practice since ancient times. For example, Hinduism teaches that its four aims of life – liberation (*moksha*), virtue (*dharma*), wealth (*artha*) and pleasure (*kama*) – can only be attained through knowledge (*vidya*) (Alpana 2011, V 2015). Although it emphasizes spiritual education, it also appreciates practical knowledge, recognizing that such knowledge is necessary to successfully navigate through the material world (Swarup 2000 [1971], Alpana 2011, Sheshagiri 2011). Historically, one of the most important educational organizations was the *gurukula*, the forest or community school of the *guru* or teacher (V 2015, Gupta 2013). These schools existed in India for 3,000 years. Teaching was based on rigid adherence to the scriptures. Until the 18th century, both children from the lower castes and girls were excluded from this as well as other types of formal education (Foster Carroll 1983).

Another less-known example of a world religion stressing the importance of education is Buddhism (Ling 1976, Bodhi 1998). In contrast to Hinduism, Buddha strongly denounced inequality on the grounds of birth and caste (Sheshagiri 2011). He taught that every person, whether male or female, had the right to be educated (Foster Carroll 1983). In the early days, Buddhist education started as simple organizations that came to be known as monasteries. Later, a definitive school system came to be attached to the monasteries (Gamage 2011). Buddhist education primarily aims at cultivating virtues, especially those that are rooted in respect and concern for others (Bodhi 1998, Chin 2002). Its fundamental purpose is the transcendental transformation of personality (Yung 2003, Samten 2009). Fields of study that are not related to such personal transformation (e.g., grammar, philosophy, medicine) are regarded as secondary (Samten 2009). Such secondary fields of study are not completely disregarded though. Quite to the contrary, they are seen as indispensable means

to understand reality and destroy ignorance, the latter of which Buddhism regards as the root cause of suffering (Agocs 2009).

In Islam, education and academic freedom took pride of place during its golden age from the 8th to the 12th century (Nakosteen 1964, Chaney 2011). Islamic scholars translated major works from Greek, Latin, Syrian, Sanskrit and Persian into Arabic (Megahed 2011). They also made important contributions, especially to mathematics, astronomy and medicine. A system of education developed throughout the Muslim world. It consisted of an elementary and a higher level (Williamson 1987, Shamsavary et al. 1993, Megahed 2011). The elementary system, which provided education for the masses, was primarily religious, teaching the basic articles of the Qur'an and the duties of Muslims. After the Mogul invasion of the 13th century, which led to a vast destruction of manuscripts and libraries, education at all levels became confined to religious dogma and hostile to secular knowledge (Shamsavary et al. 1993, Megahed 2011). Females were excluded from the mosque, where most elementary education occurred (Foster Carroll 1983). For several centuries, girls were given only the rudiments of an Islamic education, mainly a little instruction in the Qur'an so as to be able to recite their prayers properly (Smith 1987, Jawad 1998).

Two world religions that have put comparatively little emphasis on education throughout all or most of their histories are Eastern Orthodoxy and Roman Catholicism. As the Orthodox Church regards itself as the guardian of Christian dogma and established ritual practice, it has traditionally focused more on the liturgy, prayer and spiritual guidance than on formal education (Elias 2002, Vrame 2006). Orthodox mysticism – personal experience of divine mysteries and recognition of the inadequacy of human intellect – is not conducive to formal education either (Tulasiewicz 1993). The Orthodox Church had only a limited impact on public education also because, throughout its history, it has been dominated and sidelined by the state. This was the case under the Byzantine Emperors and, after the fall of Constantinople in 1453, under the Turkish Sultans (Hans 1967). It was also the case in more recent times – particularly in Russia under the Tsars (Alston 1969, Johnson 1969) and for most of the 20th century in the whole of eastern Europe under the Communist rulers (Matthews 1982, Ellis 1986, Ware 2015).

Under Roman Catholicism before the Reformation, school populations were small, with literacy being largely limited to the clergy and the nobility (Bowen 1981). The sole purpose of education was to secure and promote Christian faith (Boyd and King 1975). In response to the Reformation, Rome became even more conservative (Bowen 1981). It tightened control of its schools, colleges and universities, persecuted heretics (Burman 2004) and promulgated an Index of Forbidden Books (Lenard 2006). The Index, which was abolished

as late as 1966, contained the works of eminent scholars such as Copernicus, Bacon, Kepler, Galileo, Pascal, Locke and Hume. As another measure of fighting Protestantism, several Catholic orders were founded in the 16th century. The most important of them, the Society of Jesus, provided secondary education for boys only, and mostly for those of the upper classes (O'Malley 2014). Its education remained strictly within a theological framework approved by Rome. Until the 19th century, there were few educational opportunities for girls (Bowen 1981). During that time, the Catholic Church also neglected primary education, both in the European countries where its monopoly remained in place – e.g., Spain, Portugal and Italy – as well as in these countries' colonies, where the Church largely confined itself to converting the natives (Hans 1967, Bowen 1981, Burkholder and Johnson 2014).

While historically, religious organizations were the first, and for many centuries the only institutions providing some kind of formal education, ever since the age of Enlightenment, the formal role of religion in education has been strongly diminished, especially in the West. Education was almost completely secularized and the school systems were taken over by the state, either entirely or for the most part (Boyd and King 1975). However, for several reasons some world religions are likely to have continued to influence schooling even in the recent past, at least to some degree. First, most people still identify with a religious group. In 2010 no less than 84% of the global population were affiliated with a religion (Pew Research Center 2012). If their religion places a high emphasis on education, parents might have increasingly sent their children to school and requested policy makers to expand educational provision. Second, religious authorities with well-established links to governmental policy makers might have successfully lobbied for an expansion of schooling. Third, politicians might have expanded the supply of schooling on their own initiative if their religious beliefs induced them to do so. However, ex ante it is unclear which world religions, through these different players, have recently influenced schooling at the national level, primarily because different religions have different views on schooling and because the recent influence of religions has varied both by country and by religion – not least because other players who are not or less motivated by religion, such as teachers unions, have influenced educational provision as well. Therefore, it is impossible to make specific theoretical predictions. Rather, the question which world religions have exerted a contemporary influence on the extent of secondary schooling at the national level in the recent past needs to be resolved empirically. When discussing our regression results, we will, for each world religion, look at its views on education and its recent influence on schooling in major countries. This should enable us to correctly interpret our estimates.

Our paper makes several contributions. First, whereas almost all previous econometric papers study the effect of a few religions only, our paper covers all major world religions. Specifically, it covers Islam, Judaism, Roman Catholicism, Protestantism, Eastern Orthodoxy, Hinduism, Buddhism and other Eastern religions (including Confucianism). Second, whereas most previous econometric papers use individual-level data, we use country-level data, which enables us to estimate the effect of these religions on national rates of schooling. Third, our paper is one of the first studies using country-level data that exploits not only variations of religious population shares across countries but also changes in such shares through time. Fourth, our sample of countries is exceptionally large. By contrast, most previous econometric studies use data from a single country only, and almost all of the few existing multi-country studies use data from far fewer countries than we do. Fifth, our sample period is much longer than those of previous studies, most of which use data from a few years only. The larger country sample combined with the longer sample period leads to more general results. Finally, unlike most previous papers using country-level data, we include a large number of controls and perform a battery of robustness checks.

The remainder of the paper is organized as follows. While section 2 briefly surveys the previous econometric literature, section 3 describes our variables and methodology. Section 4 presents and discusses our regression results. Section 5 concludes.

2 Previous Econometric Studies

Almost all previous econometric studies use data from the recent past. Among the most clear-cut results from these studies are those for Islam. Particularly, almost all studies find this religion to have a negative effect on female education. Examples of multi-country studies reporting such an effect include Marshall (1985), Mincer (1996), Fish (2002), Norton and Tomal (2009), Papagapitos and Riley (2009), Cooray and Potrafke (2011) and Castelló-Climent and Hidalgo-Cabrillana (2012). Furthermore, using data on more than 60 countries from the World Values Survey, both Guiso et al. (2003) and Fish (2011) report that Muslims mostly agree with the statement, "A university education is more important for a boy than for a girl". Single-country studies, too, almost unequivocally find Islam to negatively affect female education. Examples include Mukhopadhyay's (2011) paper using US data and Ahmed's (2007) paper, which uses data from India. Also using Indian data, Kingdon (2002) finds Islam to have a negative effect not only on females but also on males.

Similarly, Bessey (2013) reports that in China Muslims acquire significantly less education than people with no religion.

The results for Judaism are also unambiguous, but so far all studies on this religion have used US data only. These studies consistently find Jews to acquire more education than other individuals (e.g., Chiswick 1993, Lehrer 1999, Sander 1992, 2010). The positive effect of Judaism pertains to women too. For example, Lehrer (2010) finds Jewish women to complete the most years of schooling, compared with other non-Hispanic white women. Similarly, Keysar and Kosmin (1995) report that, among white women, the odds of acquiring college education were highest among those of Jewish faith.

Results from previous research are more mixed for Protestantism. For example, Castelló-Climent and Hidalgo-Cabrillana (2012) find this religion to have no statistical significant effect in their sample of 63 countries. According to papers using data on the United States only, in this country the type of Protestantism matters. Specifically, whereas educational attainment is found to be lowest among fundamentalist or conservative Protestants, mainline Protestants are found to be at the center of the distribution (Darnell and Sherkat 1997, Lehrer 1999, 2006, 2010, Massengill 2008 and Sherkat 2011). Papers using data from the 19th century rather than from the last few decades find that Protestantism had a positive impact on schooling and educational performance in both Prussia and Switzerland (Becker and Woessmann 2009, 2010, Boppart et al. 2013, 2014). In 19th century Prussia, it also closed the gender gap in basic education (Becker and Woessmann 2008).

For Roman Catholicism, the results from previous econometric studies are mixed as well. For example, whereas Bessey (2013) finds that, in China, Japan and South Korea, Catholics acquire more education than those with no religious affiliation, Aldieri and Autiero (2013) report that, in their sample of eight Latin American countries, Catholicism has a negative effect on the probability of having achieved university education. In their much larger sample of countries, Castelló-Climent and Hidalgo-Cabrillana (2012) find the effect of Catholicism on educational attainment to be statistically insignificant. The results from studies using US data only are mixed as well. On the one hand, several studies report a negative effect. Specifically, Sherkat (2011) finds Catholics to have significantly lower levels of scientific literacy when compared with secular Americans. Mukhopadhyay (2011) reports that high religiosity reduces educational attainment for Catholic women. Goldin and Katz (2009) find that the share of Catholics had a negative effect on both school attendance and secondary school graduation rates between 1910 and 1940. On the other hand, using data from the 1980s Sander (1992), Evans and Schwab (1995) and Neal (1997) find a positive effect of Catholicism on educational attainment in the

US. Similarly, Vella (1999) reports a positive effect of this religion on educational attainment in contemporary Australia.

Other religions than Islam, Judaism, Protestantism and Catholicism have been covered in a few studies only. For example, only Norton and Tomal (2009), who use data on 97 countries from the early to mid-1990s, additionally cover Hinduism, finding that this religion has a negative effect on female education. Both Norton and Tomal (2009) and Bessey (2013) include Eastern Orthodoxy in their regression analysis. Their results are inconclusive though. Specifically, Norton and Tomal (2009) find this religion to have a negative effect on female education in some but not in all of the relevant specifications. By contrast, according to Bessey (2013), in Taiwan Orthodox Christians spend more years in education than the religiously unaffiliated. The results for Buddhism are even more contradictory. Bessey (2013) finds that, relative to those with no religious affiliation, Buddhists acquire more education in Japan but less in Taiwan, while in China and South Korea the differences between the two groups are insignificant. Using data from the United States, Sander (2010) finds that Buddhists born in this country and/or living there at age 16 acquire more education than Protestants, but people with a Buddhist upbringing do not.

3 Variables and Methodology

3.1 *Variables*

We use the following eight religion variables: Hinduism, Buddhism, other Eastern religions, Judaism, Islam, Eastern Orthodoxy, Roman Catholicism and Protestantism. Each of these variables measures the share of the population adhering to the respective religion (for definitions, descriptive statistics and sources of all variables, see Table A1). The data are from Maoz and Henderson's (2013a) World Religion Dataset. Drawing on multiple sources, this dataset is one of only few to provide data on religion adherence for a large number of countries over a long period of time. Specifically, it gives quinquennial data for all countries over the period 1945 to 2010 (Maoz and Henderson 2013b). For two reasons, it is a substantial improvement over the previously best sources of such data, the World Christian Database (Center for the Study of Global Christianity 2015) and its predecessor, the World Christian Encyclopedia (Barrett 1982, Barrett et al. 2001). First, it provides data at more frequent intervals. Second, it avoids the key downside of the latter sources – namely, that they give higher estimates for the share of Christians in comparison to other cross-national datasets (Hsu et al. 2008).

Specific comments on three of our religion variables are in order. First, 'Buddhism' includes Shinto for Japan. This is because many Japanese combine

elements of both religions in a syncretic fashion, yet only a small percentage of these identify themselves as Shintoists in surveys (Breen and Teeuwen 2010). Second, because only a tiny number of people identify themselves as Confucians in surveys, there is no separate variable for Confucianism. Instead, this religion is included in the group of 'other Eastern religions'. The role Confucianism has played in education across East Asia over recent decades has been large (To 1993, Starr 2012). Unfortunately, this is hard to quantify. Third, 'Protestantism' encompasses all churches that can trace their roots back to the Reformation. This includes, among many others, the Anglican Church. Counting this church as part of the Protestant movement is in line with most of the previous literature (e.g., Bowen 1981, Pew Research Center 2011, Robinson 2012).

The reference category for our religion variables is the share of the population adhering to other religions plus the share of the non-religious population. In some unreported robustness checks, we used three alternative reference categories, one at a time: Eastern religions, Islam and Christianity. When using any of these alternatives, the estimates for the included religion variables are little affected – i.e., they are similar to the estimates reported in section 4.

Our main dependent variable is the secondary enrollment rate. Because several religions have restricted the schooling of girls for a long time, we additionally use the female secondary enrollment rate as a dependent variable. We also employ the male secondary enrollment rate, to see how religions have affected the education boys in the recent past. We do not use the primary enrollment rate because in most countries primary education has been compulsory for many years.

We include a large number of variables to control for the impact of other potentially important determinants of schooling. The control variables we employ have been selected on the basis of the relevant theoretical and empirical literature. For brevity, instead of surveying this literature in detail let us just list the variables and cite some of the papers that have found the respective variable to be potentially important. To start with, we control for the share of public spending on education in GDP (e.g., Heylen and Pozzi 2007, Castelló-Climent and Hidalgo-Cabrillana 2012). Furthermore, we control for political rights and civil liberties and, in one robustness check, alternatively for the degree of autocracy/democracy (e.g., Lake and Baum 2001, Rudra and Haggard 2005, Eterovic and Sweet 2014). In another robustness check, we additionally control for religious pluralism (e.g., Alesina et al. 2003, Gruber 2005). We employ several demographic variables: life expectancy (e.g., Soares 2005, Cervellati and Sunde 2005), death rate (e.g., Kalemli-Ozcan et al. 2000, Forston 2011), urbanization rate (e.g., Mincer 1996, Bertinelli and Zou 2008) and, in one robustness check, population growth rate (e.g., Becker and Lewis 1973, Hanushek 1992). We also control for relevant economic characteristics.

Specifically, we use GDP per capita (e.g., Mincer 1996, Papagapitos and Riley 2009), GDP growth rate as a proxy for business cycle fluctuations (e.g., DeJong and Ingram 2001, Méndez and Sepúlveda 2012), private credit as a proxy for credit constraints (e.g., De Gregorio 1996, Flug et al. 1998), openness (e.g., Findlay and Kierzkowski 1983, Ranjan 2001), physical capital stock and, in one robustness check, physical investment (e.g., Griliches 1969). In our final four robustness checks, we additionally control for economic instability and different types of crises, using the variables inflation rate, systemic banking crises, natural disasters and wars (e.g., Skidmore and Toya 2002, Heylen and Pozzi 2007, Crespo Cuaresma 2010).

3.2 *Methodology*

Our dataset of 143 countries over 1973–2012 was constructed in three steps (for a list of countries, see Appendix). In a first step, we collected panel data at annual frequency, covering as many countries and years as possible (given data availability). In a second step, we filled gaps in the data. Specifically, as data in the World Religion Dataset are available at five-year intervals only, we filled these gaps by linear interpolation. This is justifiable because religion population shares change only gradually over time. Also as part of our second step, for our religion variables we used the data for the final year in the World Religion Dataset, 2010, also for the years 2011 and 2012, the two last years of our sample period. This is preferable to linear extrapolation as the latter can quickly lead to implausible values. For our other variables, we also filled any gaps in the data by linear interpolation because, as in the case of our religion variables, the data for the most important of our other variables – namely, the three enrollment variables – also change gradually over time. Furthermore, for both our dependent variables and our control variables, data gaps were much rarer than in the World Religion Dataset. Indeed, most of our control variables, including those that display swings from year to year such as the GDP growth rate, did not have any gaps at all. In the third step of constructing our dataset, we averaged the annual data over non-overlapping five-year periods. This eliminates noise, reduces measurement error and, because in our regressions we lag our explanatory variables by one period (see below), makes it more likely that our estimates capture the effects of religions on school enrollment.

We estimate the following model:

$$S_{i,t} = \sum_{j=1}^{8} \gamma_j R_{j,i,t-1} + \sum_{k=1}^{q} \beta_k X_{k,i,t-1} + \alpha_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

$S_{i,t}$ is a secondary enrollment rate variable of country i in five-year period t, covering girls and boys either jointly or separately. $R_{j,i,t-1}$ is a vector of our eight religion variables and $X_{k,i,t-1}$ represents a vector of q control variables. While α_i and λ_t are country and period fixed effects, respectively, $\varepsilon_{i,t}$ is the error term.

Country fixed effects are included to control for the impact of unobserved country-specific characteristics. They are also useful in removing omitted factors that influence both school enrollment and religion adherence in the long run. Furthermore, a model with country fixed effects uses only the time-series variation within countries, not the variation between countries. This is appropriate in our case as we intend to study the contemporary influence of world religions, not any historical legacy they might have left in education. Whereas time-series variations within countries can single out contemporary effects, cross-country differences may be co-determined by historical legacies. For example, traditionally Protestant countries today may have higher enrollment rates than other countries mainly because of the influence Protestantism had on education in the distant past. In contrast to such a historical legacy, contemporary Protestantism may no longer have any or only little influence on education. It is the latter issue we are interested in.

Period effects are included to control for the impact of shocks that are common across countries. Additionally, they ensure that our estimates do not reflect over-time trends in school enrollment or religion adherence at the world level over the sample period. More generally, by using both country and period effects plus a large number of control variables we intend to ensure that our regression analysis accounts for other factors than religion that affect school enrollment, some of which may be correlated with one or more of the religion variables.

Causality may not only run from religion to education but also vice versa. Several studies using individual-level data find education to affect religiosity.[2] Although there are no studies using country-level data that find education to affect religion adherence, endogeneity of our religion variables cannot be ruled out. Some or all of our control variables may be endogenous too. Unfortunately, there are no valid instruments. For example, we tried General Method of Moments (GMM). However, the results from the Hansen (1982) test of joint validity of instruments produced high p values throughout, suggesting that GMM would be inappropriate in our case. The problem is probably one of

2 It is unclear whether the effect of education on religiosity (if any) is positive or negative. Studies reporting a positive effect include Brañas-Garza and Neuman (2004) and Brown and Taylor (2007). Studies reporting a negative effect include Hungerman (2014) and Mocan and Pogorelova (2014).

instrument proliferation, i.e., the fact that the number of instruments in GMM tends to explode with the number of time periods. Instrument proliferation can overfit endogenous variables and fail to expunge their endogenous components, a telltale sign being high Hansen test *p* values (Roodman 2009a, 2009b). We experimented with various ways of reducing the instrument count, such as limiting the lags in GMM-style instruments and collapsing instruments, but none of this solved the problem.

As neither GMM nor other forms of instrumental variables estimation are applicable, we lag all explanatory variables by one five-year period. This should lessen concerns about possible endogeneity bias. For example, whereas it is hard to imagine that future changes in the secondary enrollment rate can affect current religion adherence shares, it is very well possible that changes in religion adherence in one five-year period affect secondary enrollment in the following five-year period.

As there is no better way to address potential endogeneity, the regression analysis presented below does not establish causality. Instead, the regressions are used to measure conditional correlations, i.e., to assess whether our religion variables are statistically significant after controlling for other relevant factors. Still, the estimates for our religion variables are likely to be causal for four reasons. First, we control for most major determinants of school enrollment that have been found in the previous literature. Second, we also control for unobserved country and period effects. Third, we ensure that our religion variables do not proxy for factors such as public spending on education, political freedom or GDP per capita. Fourth, all explanatory variables enter the equation with a lag of one five-year period.

4 Results and Discussion

Tables 1 to 4 present our regression results. Tables 1 to 3 report the results from our main regressions – Table 1 for both genders combined and Table 2 (3) for girls (boys) only. In each of these tables, column 1 reports the results from our baseline regression while the other columns report the results from our main robustness checks. Table 4 presents the results from regressions in which we exclude outliers. Specifically, we exclude India and Nepal from regressions 1 to 3 and Israel from regressions 4 to 6. As the share of Hindus is exceptionally large in India and Nepal, and similarly the share of Jews in Israel, the intention behind excluding these outliers is to see whether our main results for Hinduism and Judaism, respectively, remain unchanged. To save space, the

estimates for the control variables are omitted from Tables 2 to 4. In Tables 2 and 3, each regression uses the same controls as the corresponding regression reported in the same column of Table 1. In Table 4, each regression employs the control variables used in the baseline regression (column 1 of Table 1).

4.1 *Hinduism*

In each of our main regressions, the coefficient on Hinduism is positive and significant, indicating that, over the sample period, this religion has had a positive effect on secondary schooling. According to our estimates, the effect was large. Specifically, a five percentage point increase in the Hindu population share is associated with an increase in the secondary enrollment rate of about 7 ½ percentage points, ceteris paribus. The effect on girls is even larger, a five percentage point increase being associated with an increase in the female secondary enrollment rate of almost nine percentage points, ceteris paribus. The effect on boys is smaller but still large, a five percentage point increase in the Hindu population share being associated with an increase in the male secondary enrollment rate of more than six percentage points, ceteris paribus. When excluding India and Nepal, the coefficient on Hinduism is significant too, though slightly smaller.

The positive effect of Hinduism is probably due to a combination of the fact that this religion has traditionally highly valued education (section 1) and the fact that school enrollment in Hindu societies has substantially increased only in the recent past. For example, in India since independence in 1947 the government, which nowadays runs most schools, has made strenuous efforts to raise educational attainment, intending to prepare young people for the modern working world (Sebaly 1993, Sheshagiri 2011). Under the constitution, education is free and compulsory between the ages of 6 and 14 (Singh and Nath 2005). Because of high rates of teacher absenteeism and low levels of learning achievement in India's government-run schools, private schools have proliferated in recent decades. For example, between 1993 and 2002 almost 40% of the increase in enrollment occurred in the latter, and in the early 2000s these schools accounted for approximately 30% of total enrollment (Kingdon 2007). Although private schools usually charge fees, they are used even by the poor.

In Nepal, since democracy was adopted in 1951, thousands of public schools have been established, where education is free up to the secondary level (Parajuli and Das 2013). In recent decades, private schools have proliferated in this country too. Nowadays, most middle-class families prefer to send their children to such schools, where the quality of education is much higher. In the early 2000s, about 15% of students attended private schools (Parajuli and Das 2013).

TABLE 1 *Fixed effects regressions of secondary enrollment rate.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Baseline specification	**Democracy substituted for political rights & civil liberties**	**Religious pluralism added**	**Population growth rate added**	**Physical investment added**	**Inflation rate added**	**Systemic banking crises added**	**Natural disasters added**	**Wars added**
Hinduism	153.93***	153.18***	154.15***	155.66***	150.39***	154.82***	153.94***	152.72***	153.27***
	(43.98)	(46.16)	(44.24)	(43.99)	(44.00)	(44.07)	(43.94)	(45.23)	(43.89)
Buddhism	1.56	−2.22	2.93	2.04	1.32	1.62	1.70	1.62	2.00
	(49.14)	(49.01)	(50.25)	(48.70)	(52.23)	(49.19)	(49.28)	(48.81)	(49.09)
Other Eastern religions	107.56**	110.77**	108.13**	109.21**	110.74**	107.18**	107.14**	108.19**	103.86**
	(48.30)	(48.09)	(48.77)	(48.53)	(48.74)	(48.42)	(48.21)	(48.20)	(48.81)
Judaism	133.48***	125.38***	134.95***	134.19***	131.93***	135.58***	133.33***	133.63***	127.35***
	(39.25)	(40.54)	(40.37)	(39.57)	(38.86)	(39.78)	(38.72)	(39.22)	(39.66)
Islam	−66.86**	−70.68**	−66.48**	−64.93**	−66.53**	−66.80**	−66.35**	−66.91**	−66.64**
	(27.86)	(27.44)	(28.26)	(27.82)	(28.23)	(27.86)	(28.12)	(27.83)	(27.82)
Eastern Orthodoxy	−14.36	−11.15	−12.64	−13.17	−17.29	−14.96	−14.07	−14.60	−17.79
	(42.63)	(46.59)	(43.59)	(41.99)	(43.05)	(42.67)	(42.41)	(42.52)	(41.81)

Roman Catholicism	8.01	12.02	9.29	7.38	7.91	8.71	7.90	7.66	7.75
	(16.08)	(16.53)	(17.38)	(16.20)	(15.92)	(16.19)	(16.16)	(15.95)	(16.12)
Protestantism	10.42	8.90	11.92	10.98	9.88	10.49	10.60	10.47	10.03
	(16.64)	(17.55)	(16.62)	(16.70)	(16.48)	(16.67)	(16.60)	(16.61)	(16.53)
Public spending on education	−1.44	−1.51	−0.97	−4.22	−2.73	−1.84	−0.99	−1.32	−0.86
	(29.88)	(31.39)	(30.75)	(29.77)	(30.27)	(29.71)	(29.75)	(30.19)	(30.69)
Political rights & civil liberties	−3.80		−3.80	−3.42	−3.78	−3.90	−3.83	−3.81	−3.90
	(3.36)		(3.38)	(3.31)	(3.40)	(3.38)	(3.36)	(3.37)	(3.38)
Life expectancy	1.23**	1.20**	1.23**	1.19**	1.22**	1.23**	1.23**	1.24**	1.22**
	(0.48)	(0.49)	(0.49)	(0.49)	(0.48)	(0.48)	(0.48)	(0.49)	(0.48)
Death rate	1.80**	1.68**	1.79**	1.67**	1.82**	1.79**	1.79**	1.81**	1.79**
	(0.72)	(0.70)	(0.72)	(0.74)	(0.73)	(0.72)	(0.72)	(0.72)	(0.72)
Urbanization rate	46.55*	47.96*	46.76*	45.06*	46.61*	46.42*	46.52*	46.77*	44.84*
	(26.11)	(27.76)	(26.40)	(25.98)	(25.89)	(26.19)	(26.07)	(26.19)	(26.48)
GDP per capita	−1.94	−1.88	−1.97	−1.55	−1.85	−1.94	−1.97	−1.93	−2.07
	(2.33)	(2.45)	(2.33)	(2.47)	(2.33)	(2.34)	(2.33)	(2.34)	(2.33)
GDP growth rate	10.06	10.75	10.22	10.43	7.57	8.92	9.14	10.41	7.78
	(12.58)	(13.08)	(12.65)	(12.47)	(12.09)	(12.93)	(12.99)	(12.56)	(12.67)
Private credit	0.43	1.08	0.36	0.72	0.18	0.48	0.51	0.44	0.35
	(3.47)	(3.95)	(3.52)	(3.43)	(3.54)	(3.48)	(3.42)	(3.47)	(3.44)

TABLE 1 *Fixed effects regressions of secondary enrollment rate.* (cont.)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Baseline specification	**Democracy substituted for political rights & civil liberties**	**Religious pluralism added**	**Population growth rate added**	**Physical investment added**	**Inflation rate added**	**Systemic banking crises added**	**Natural disasters added**	**Wars added**
Physical capital stock	−1.24**	−1.23**	−1.23**	−1.25**	−1.23**	−1.24**	−1.23**	−1.25**	−1.24**
	(0.48)	(0.47)	(0.49)	(0.49)	(0.48)	(0.49)	(0.48)	(0.48)	(0.49)
Openness	−5.38	−3.49	−5.39	−5.45	−5.99	−5.34	−5.38	−5.42	−5.15
	(4.23)	(4.33)	(4.24)	(4.19)	(4.50)	(4.23)	(4.24)	(4.21)	(4.23)
Democracy		−2.68							
		(2.95)							
Religious pluralism			2.08						
			(16.35)						
Population growth rate				−54.21					
				(58.78)					
Physical investment					7.30				
					(7.81)				
Inflation rate						−0.04			
						(0.06)			

Systemic banking crises							−0.68 (2.24)		
Natural disasters								4.87 (11.35)	
Wars									−14.50*** (5.05)
Number of observations	676	632	676	676	673	675	676	676	676
Number of countries	143	131	143	143	142	143	143	143	143
R^2 within	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.64
F statistic	42.34***	44.88***	40.34***	40.68***	39.64***	40.47***	40.86***	42.13***	42.73***
Standard error of regression	6.68	6.73	6.68	6.68	6.69	6.68	6.68	6.68	6.67

Note: Pooled least squares regressions with country-specific fixed effects. The data are non-overlapping five-year averages spanning 1973 to 2012. All explanatory variables are lagged by one five-year period. All regressions also contain period dummies and a constant term. Robust standard errors, adjusted for clustering at the country level, are reported in parentheses. ***(**/*) denotes statistically significant at the 1%(5%/10%) level.

TABLE 2 *Fixed effects regressions of female secondary enrollment rate.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Baseline specification	**Democracy substituted for political rights & civil liberties**	**Religious pluralism added**	**Population growth rate added**	**Physical investment added**	**Inflation rate added**	**Systemic banking crises added**	**Natural disasters added**	**Wars added**
Hinduism	177.71***	168.57***	177.90***	180.10***	174.70***	178.51***	177.71***	176.51***	177.02***
	(49.39)	(49.62)	(49.55)	(49.66)	(49.64)	(49.49)	(49.37)	(50.83)	(49.02)
Buddhism	−19.59	−20.94	−18.43	−18.82	−21.83	−19.60	−19.48	−19.48	−19.10
	(48.53)	(48.09)	(49.76)	(47.76)	(51.34)	(48.57)	(48.61)	(48.28)	(48.49)
Other Eastern religions	89.69*	92.12*	90.18*	91.99*	91.40*	89.28*	89.40*	90.36*	85.60*
	(48.86)	(50.66)	(49.21)	(49.19)	(49.45)	(49.00)	(48.85)	(48.71)	(49.35)
Judaism	173.19***	170.64***	174.44***	174.24***	172.09***	174.97***	173.09***	173.40***	166.40***
	(41.59)	(45.22)	(42.83)	(42.15)	(41.40)	(42.10)	(41.12)	(41.55)	(42.00)
Islam	−71.48**	−74.67**	−71.16**	−68.64**	−70.88**	−71.39**	−71.14**	−71.53**	−71.25**
	(29.05)	(28.64)	(29.31)	(28.84)	(29.27)	(29.06)	(29.28)	(28.99)	(28.97)
Eastern Orthodoxy	3.82	−0.84	5.28	5.54	1.59	3.67	4.02	3.61	0.02
	(43.81)	(48.62)	(45.12)	(42.85)	(44.37)	(43.81)	(43.60)	(43.73)	(43.00)

Roman Catholicism	16.52	20.24	17.60	15.68	16.50	17.14	16.47	16.20	16.25
	(13.65)	(16.11)	(15.62)	(13.72)	(13.58)	(13.72)	(13.72)	(13.55)	(13.70)
Protestantism	9.99	9.55	11.24	10.76	9.56	10.10	10.09	10.01	9.54
	(16.94)	(18.02)	(16.31)	(17.03)	(16.84)	(16.96)	(16.86)	(16.90)	(16.83)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	668	624	668	668	665	667	668	668	668
Number of countries	142	130	142	142	141	142	142	142	142
R^2 within	0.64	0.64	0.64	0.65	0.64	0.64	0.64	0.64	0.65
F statistic	51.91***	54.49***	49.56***	49.97***	48.44***	49.73***	49.79***	50.11***	51.28***
Standard error of regression	6.89	7.00	6.90	6.89	6.91	6.90	6.90	6.90	6.88

Note: Pooled least squares regressions with country-specific fixed effects. Each regression uses the same control variables as the corresponding regression reported in the same column of Table 1. For brevity, the estimates for the control variables are omitted. The data are non-overlapping five-year averages spanning 1973 to 2012. All explanatory variables are lagged by one five-year period. All regressions also contain period dummies and a constant term. Robust standard errors, adjusted for clustering at the country level, are reported in parentheses. ***(**/*) denotes statistically significant at the 1%(5%/10%) level.

TABLE 3 *Fixed effects regressions of male secondary enrollment rate.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Baseline specification	**Democracy substituted for political rights & civil liberties**	**Religious pluralism added**	**Population growth rate added**	**Physical investment added**	**Inflation rate added**	**Systemic banking crises added**	**Natural disasters added**	**Wars added**
Hinduism	126.77***	137.73***	127.08***	127.60***	123.39***	127.85***	126.76***	126.45***	126.19***
	(44.66)	(47.46)	(45.15)	(44.69)	(44.64)	(44.67)	(44.70)	(45.40)	(44.91)
Buddhism	16.19	9.02	18.10	16.46	18.04	16.25	16.33	16.22	16.60
	(51.51)	(52.00)	(52.88)	(51.30)	(54.69)	(51.56)	(51.62)	(51.44)	(51.46)
Other Eastern religions	128.44**	129.95***	129.23**	129.24**	132.32**	127.92**	128.06**	128.62**	125.01**
	(50.38)	(48.27)	(50.80)	(50.43)	(51.00)	(50.47)	(50.26)	(50.20)	(50.95)
Judaism	104.07**	87.04*	106.12**	104.44**	102.50**	106.57**	103.94**	104.13**	98.39*
	(51.08)	(50.50)	(52.35)	(51.25)	(50.56)	(52.60)	(50.48)	(51.07)	(51.56)
Islam	−61.47**	−65.77**	−60.95**	−60.48**	−61.16**	−61.38**	−61.04**	−61.49**	−61.29**
	(29.75)	(29.31)	(30.06)	(29.80)	(30.05)	(29.73)	(29.99)	(29.75)	(29.73)
Eastern Orthodoxy	−36.41	−25.83	−34.03	−35.81	−39.31	−36.91	−36.16	−36.47	−39.60
	(44.27)	(47.04)	(44.83)	(44.16)	(44.58)	(44.33)	(44.18)	(44.25)	(43.45)

Roman Catholicism	−0.58	3.45	1.19	−0.88	−0.66	0.27	−0.66	−0.67	−0.81
	(18.92)	(16.27)	(20.33)	(19.05)	(18.73)	(19.09)	(18.99)	(18.76)	(18.95)
Protestantism	11.03	7.79	13.08	11.30	10.50	11.15	11.17	11.04	10.66
	(17.46)	(18.10)	(18.23)	(17.50)	(17.31)	(17.50)	(17.48)	(17.46)	(17.36)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	668	624	668	668	665	667	668	668	668
Number of countries	142	130	142	142	141	142	142	142	142
R^2 within	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
F statistic	23.57***	24.39***	22.37***	22.87***	22.33***	22.47***	22.67***	22.93***	23.70***
Standard error of regression	6.58	6.55	6.59	6.59	6.60	6.59	6.59	6.59	6.58

Note: Pooled least squares regressions with country-specific fixed effects. Each regression uses the same control variables as the corresponding regression reported in the same column of Table 1. For brevity, the estimates for the control variables are omitted. The data are non-overlapping five-year averages spanning 1973 to 2012. All explanatory variables are lagged by one five-year period. All regressions also contain period dummies and a constant term. Robust standard errors, adjusted for clustering at the country level, are reported in parentheses. ***(**/*) denotes statistically significant at the 1%(5%/10%) level.

TABLE 4 *Outliers excluded.*

	(1)	(2)	(3)	(4)	(5)	(6)
	India & Nepal excluded			Israel excluded		
	Secondary enrollment rate	Female secondary enrollment rate	Male secondary enrollment rate	Secondary enrollment rate	Female secondary enrollment rate	Male secondary enrollment rate
Hinduism	146.55***	161.65***	127.24**	153.10***	176.64***	124.74***
	(48.10)	(50.49)	(49.70)	(43.82)	(49.09)	(44.82)
Buddhism	1.86	−18.90	16.18	0.80	−20.27	14.42
	(49.23)	(48.58)	(51.60)	(49.24)	(48.66)	(51.49)
Other Eastern religions	107.64**	89.83*	128.48**	105.09**	87.49*	123.25**
	(48.30)	(48.85)	(50.37)	(48.88)	(49.36)	(51.17)
Judaism	133.30***	172.78***	104.10**	312.95	382.20	509.05*
	(39.08)	(41.24)	(50.97)	(278.75)	(320.60)	(281.15)
Islam	−67.12**	−72.08**	−61.38**	−67.37**	−72.22**	−63.12**
	(27.94)	(29.16)	(29.79)	(27.84)	(28.99)	(29.72)
Eastern Orthodoxy	−14.18	4.19	−36.40	−17.39	0.41	−43.37
	(42.51)	(43.65)	(44.24)	(40.76)	(42.65)	(40.45)

Roman Catholicism	7.83	16.12	−0.55	6.54	14.94	−3.90
	(16.09)	(13.66)	(18.94)	(16.41)	(13.81)	(19.51)
Protestantism	10.26	9.60	11.08	9.70	9.32	9.51
	(16.66)	(16.96)	(17.48)	(16.64)	(16.98)	(17.38)
Baseline control variables	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	671	663	663	669	661	661
Number of countries	141	140	140	142	141	141
R^2 within	0.63	0.64	0.61	0.63	0.64	0.61
F statistic	43.40***	54.97***	23.37***	41.07***	53.85***	22.63***
Standard error of regression	6.70	6.91	6.61	6.71	6.93	6.60

Note: Pooled least squares regressions with country-specific fixed effects. Each regression uses the same control variables as the baseline regression reported in column 1 of Table 1. For brevity, the estimates for the control variables are omitted. The data are non-overlapping five-year averages spanning 1973 to 2012. All explanatory variables are lagged by one five-year period. All regressions also contain period dummies and a constant term. Robust standard errors, adjusted for clustering at the country level, are reported in parentheses. ***(**/*) denotes statistically significant at the 1%(5%/10%) level.

In India, Nepal as well as in Hindu communities outside these countries, Hindu parents go to great lengths to educate at least the male children in the family (Sheshagiri 2011). Over recent decades, governments in both countries, as well as in other countries with large Hindu communities, have made particular efforts to improve the education of girls and children from the lower castes (Sebaly 1993). Overall, these efforts by parents and governments have led to a strong increase in secondary enrollment, particularly of girls, during our sample period. For example, from 1973 to 2012 the secondary enrollment rate rose from 25% to 72% in India and from 13% to 66% in Nepal. Over the same period, the female secondary enrollment rate even rose from 15% to 69% in India and from as little as 4% to 67% in Nepal. These developments, which could also be observed in other countries with substantial Hindu populations, explain our estimates for the Hinduism variable. They also explain the negative effect of Hinduism on female education during the early to mid-1990s found by Norton and Tomal (2009) (section 2) because back then the gender gap in education was still wide in Hindu societies.

4.2 *Buddhism*

Our estimates for the Buddhism variable are statistically insignificant throughout. This may be due to several reasons. First, there are far fewer Buddhists than Hindus around the world, and in many countries they represent only a small fraction of the population. Second, Buddhist education prioritizes the transcendental transformation of personality over public schooling (section 1). For both reasons, Buddhism might have had little impact on national school enrollment rates.

However, there is a third possible reason why our estimates for this religion are insignificant. Because of Buddhism's strong focus on education, its appreciation of secular education (although ranked second) and its request to provide education for all people without discrimination, education has been held in high esteem among the general population of traditionally Buddhist countries for centuries. Therefore, for many years most of these countries have had unusually high rates school enrollment among both genders, especially compared with other developing countries (Gamage and Setunga 2011). For example in Sri Lanka the secondary enrollment rate was 52% as early as 1973 and the female secondary enrollment rate 49% in 1976 – far ahead of India and Nepal at the time. As we use country fixed effects (to identify recent effects of religions) the coefficient on 'Buddhism' could be insignificant because secondary enrollment was already high in Buddhist countries at the beginning of our sample period and consequently subsequent further increases have been limited.

4.3 *Other Eastern Religions*

The estimates for the 'other Eastern religions' variable are significant and positive. Specifically, a five percentage point increase in the population share of adherents to this group of religions is associated with a rise of more than five percentage points in the secondary enrollment rate, ceteris paribus. While the effect on girls is slightly smaller than on both genders combined, 4 ½ percentage points, the effect on boys is larger, more than six percentage points, ceteris paribus.

Apart from Confucianism, the group of other Eastern religions consists of Taoism, Jainism, Shinto (except for Japan) and Sikhism. Similar to Confucianism, the number of adherents to these religions is small. Furthermore, neither in Taoism nor in Jainism, Shinto and Sikhism does formal education figure prominently in their doctrines. Taoism, for example, regards formal institutions such as schools with suspicion. For the Taoist, education is a sole quest (Ford 1998). In this religion, education's purpose is to encourage self-reflection to find one's true self and to take the path to truth (Ornstein et al. 2013). Therefore, the positive effect of the 'other Eastern religions' variable is probably solely due to Confucianism. Although even in Confucian heritage societies only few people identify themselves as adherents to this religion in surveys, over our sample period it has had a profound and increasing influence on education in these societies (To 1993, Yang 1993, Starr 2012). In line with Confucian values and principles, in recent decades these societies have placed a strong emphasis on education, regarding it as both the most promising way for character development and as a pathway to upward social mobility. Also in line with Confucian values and principles, educational practice in these societies has been characterized by hard work and relentless assessment.

Partly due to the rising influence of Confucianism, school enrollment has increased strongly and to a high level in Confucian heritage societies over our sample period. For example, in South Korea from 1973 to 2011, the secondary enrollment rate rose from 47% to 97% and the female secondary enrollment rate from 38% to 96%. Equally, in China the secondary enrollment rate rose from 52% (1973) to 89% (2012) and the female secondary enrollment rate from 46% (1976) to 90% (2012). In Japan from 1973 to 2012 both the secondary enrollment rate and the female secondary enrollment rate rose from 90% to 102%. Because only a tiny number of people identify themselves as Confucians and because the group of 'other Eastern religions' also includes religions that place no special emphasis on formal education, the coefficient on 'other Eastern religions' probably underestimates the magnitude of the effect of Confucianism on secondary schooling over the sample period.

4.4 *Judaism*

Our estimates for the Judaism variable indicate that this religion has had a substantial positive effect on secondary enrollment in the recent past. Specifically, a five percentage point increase in the Jewish population share is associated with a rise in the secondary enrollment rate of about 6 ½ percentage points, ceteris paribus. Interestingly, the estimated effect for girls is larger than for boys. Specifically, while a five percentage point increase in the share of Jews among the population is associated with an 8 ½ percentage point rise in the female secondary enrollment rate, the corresponding rise in the male secondary enrollment rate is just five percentage points, ceteris paribus. In any case, our positive results accord with previous econometric studies, which use individual-level data from the US (section 2).

However, when excluding Israel from our sample, the coefficient on Judaism is statistically insignificant (except in the case of boys, where it is marginally significant). This is unsurprising. Whereas in Israel over our sample period 80% of the population was Jewish, in almost all other countries the share was below 0.1%. In the US it was 2%. Therefore, Judaism is likely to have noticeably influenced national rates of secondary enrollment in Israel only.

This is not to deny that Jews outside Israel have continued to cherish education in modern times. Quite to the contrary. From the late 18th century, Jewish schooling was modernized, especially in western countries (Iram 1993). Secular subjects and the country's language were introduced. Girls were finally admitted to school. After the Holocaust and the founding of the State of Israel, Jewish communities around the world renewed their interest in Jewish learning and Jewish identity (Zeldin 2011). At the same time, most Jews continued to increasingly integrate with the modern world and embrace secular learning (Miller et al. 2011). As a result, there emerged a religious/secular bifurcation in education among Jews, which has been most clearly evident in Israel (Iram 1993). While in the recent past the majority of Israeli children have attended state-secular schools, a substantial minority have attended state-religious or ultra-Orthodox schools, the latter of which exclude secular subjects such as mathematics and science. Still, overall school enrollment in both Israel and Jewish communities elsewhere has been further increased, reaching high levels. For example, in Israel from 1973 to 2012 the secondary enrollment rate rose from 75% to 101% and the female secondary enrollment rate from 78% to 103%.

4.5 *Islam*

In line with previous econometric studies (section 2), we find that Islam has had a substantial negative effect on education, particularly of females. Specifically,

a five percentage point increase in the share of Muslims in the population is associated with a reduction of the secondary enrollment rate of slightly more than three percentage points and with a reduction of the female secondary enrollment rate of 3 ½ percentage points, ceteris paribus. Interestingly, Islam has also had a large negative effect on the education of boys, a five percentage point increase in the Muslim population share being correlated with a three percentage point reduction in the male secondary enrollment rate, ceteris paribus.

These negative effects are in spite of the fact that since the mid-20th century all Muslim countries have made strenuous efforts to improve education. Most have combined secular education with the promotion of Islamic culture and values (Shamsavary et al. 1993). The weights attached to each have varied from country to country though. At one end of the spectrum is Turkey, which for many decades after the proclamation of the republic in 1923 attempted to secularize and westernize education (Williamson 1987, Lewis 2002). In the middle of the spectrum are moderate Muslim countries such as Indonesia. In its public schools, there has been a secular emphasis, which has been resented by many Muslims (Kuipers 2011). Therefore, a distinct minority of Muslim Indonesians has sent their children to Islamic schools, where secular subjects take a back seat and teaching focuses on the Qur'an as well as on Muslim traditions and history (Kuipers 2011). At the other end of the spectrum are strictly Islamic countries such as Iran, where after the 1979 Islamic revolution the whole education system was Islamized (Mehran 1992a, 1992b).

In many Muslim countries, the secondary enrollment rate rose markedly over our sample period. For example, from 1973 to 2012 it increased from 29% to 86% in Turkey, from 19% to 83% in Indonesia and from 37% to 86% in Iran. However, in other Muslim countries it was still very low in 2012 – e.g., in Bangladesh at 54% and Pakistan at 37%. The female secondary enrollment rate also rose markedly in many Muslim countries from 1973 to 2012 – for example, in Turkey form 17% to 84%, in Indonesia from 14% to 84% and in Iran from 26% to 83%. But in Bangladesh and Pakistan in 2012, it was still just 57% and 31%, respectively. In most Muslim countries, the education of women has still been hampered by traditional gender roles. Many girls are raised with the sole goal of being married, and after marriage a woman's primary role is to bear and raise children (Jawad 1998, Ibrahim 2011). The fact that we estimate a negative effect of Islam on the secondary enrollment rate, especially among females, suggests that the growth in that rate in most Muslim countries has been due to other factors – probably mainly the rise in life expectancy, urbanization and the general increase in living standards.

4.6 *Christianity*

The coefficients on each of the three Christianity variables are statistically insignificant throughout. However, the reasons for these insignificant results vary somewhat by religion. In the case of Eastern Orthodoxy, the main reason is that, during our sample period, the Orthodox Church continued to have hardly any influence on public education, even in countries where a large majority of the population has adhered to this religion. This has been the case in, for example, Greece – in spite of the fact that the Greek constitution mentions Eastern Orthodoxy as the prevailing religion. All education in Greek schools, including religious education, has been exclusively under the authority of the Ministry of Education and Religious Affairs (Karamouzis 2015, Koukounaras Liagkis 2015). In Russia, where the Orthodox Church re-appeared in public life since the late 1980s, the Church has also been unable to gain much influence on public education (Richters 2013). There, even after the collapse of Communism, education has been provided almost exclusively by the state and regulated by the Ministry of Education and Science.

For two reasons Eastern Orthodoxy has had hardly any influence on public education over our sample period. First, the Orthodox Church has continued to be dominated by the state. Second, it still did not develop a more open and formal approach to education (Vrame 2006). The Church has continued to focus almost exclusively on religious education and to regard sacramental participation, prayer, fasting and veneration of icons as key elements of such education (e.g., Vrame 1999). It has still appeared to be dismissive of mass schooling and renunciatory of secular education.

The insignificant estimate for the Roman Catholicism variable is also largely due to a lack of influence on education. Over the course of the 19th and 20th centuries, the influence of the Catholic Church in education gradually diminished even in strongly Catholic countries. During the 19th century, the Church opposed the expansion and secularization of education pursued by most governments in industrializing countries (Hans 1967). In 1929, Pope Pius XI promulgated *Divini Illius Magistri*, the Church's only major encyclical letter on education. As by that time the Church was no longer in control of education, the Pope accepted the role of the state in developing and maintaining educational systems (Elias 2002). However, the encyclical also explicitly denied equal education of boys and girls (Foster Carroll 1983).

The Second Vatican Council (1962–65) finally took major steps towards modernizing the Catholic Church's views on education. Its declaration *Dignitatis humanae* called for an elimination of indoctrination and manipulation,

especially when dealing with the uneducated (Elias 2002). *Gaudium et spes* recognized the right of women to acquire an education equal to that of men (Foster Carroll 1983). And *Gravissimum educationis*, the Church's latest major declaration on education, stated that all people have a right to education and recognized that the role of the school includes the task of preparing students for professional life (Fleming 2006).

From 1973 to 2012, the secondary enrollment rate increased markedly in almost all strongly Catholic countries. For example, it rose from 65% to 102% in Italy, from 59% to 131% in Spain and from 26% to 85% in Mexico. Over the same period the gender gap in education was eliminated in these and several other strongly Catholic countries. Although these developments were probably facilitated by the modernization of the Catholic Church's views on education during the Second Vatican Council, the fact that the coefficient on Roman Catholicism is statistically insignificant in each of our regressions suggests that this religion was no decisive factor behind the general rise in secondary enrollment over our sample period.

The fact that our estimates for Protestantism are insignificant too may be surprising at first glance. After all, this branch of Christianity has strongly advocated education from the outset and was instrumental in expanding educational provision in many countries, not only in western and northern Europe but also in many (former) colonies of European Protestant countries (Hans 1967, Bowen 1981). However, in several regards Protestantism became the victim of its own success. First, because it had successfully lobbied for education of both boys and girls for a long time, in most Protestant countries the secondary enrollment rate was very high for both genders already at the beginning of our sample period. Thus, even if Protestantism had still been influential in educational policy during that period, there was little more to accomplish. Given that our methodology exploits variation within but not between countries (to single out recent effects), this partly explains our insignificant coefficient on Protestantism. A second and more fundamental reason is that in almost all Protestant countries from the 19th century this religion lost nearly all of its previously strong influence in education as school systems were taken over by the state and education in government-run schools was secularized (Hans 1967, Mitchell 1993). Ironically, it had been the Protestant reformers who, from the outset, had argued that schools should be run by the state and that children needed not only religious but also secular education. Thus, by initiating the process of secularization, Protestantism unintentionally helped to eventually nearly completely eliminate its own influence on education.

5 Conclusion

Our regression results indicate that several world religions have affected national rates of secondary school enrollment in the recent past. Specifically, whereas Hinduism, other Eastern religions and Judaism are likely to have had a positive effect, Islam is likely to have had a negative effect. The magnitude of the estimated effects of Hinduism and Judaism is large, especially among females. The effect of the group of other Eastern religions is slightly smaller but substantial nonetheless and – in contrast to Hinduism, Judaism and Islam – it is larger among boys than among girls. The magnitude of the estimated effect of Islam is smaller still but also substantial, especially among girls. Furthermore, we find that neither Buddhism nor the three branches of Christianity – Eastern Orthodoxy, Roman Catholicism and Protestantism – have a statistically significant effect. As set out in detail in section 4, the estimates for each of the world religions covered can be readily explained by their views on education and their recent influence on schooling in major countries.

As mentioned in section 3, the evidence provided in this paper corresponds to conditional correlations in the data. It does not establish causality. Still, the fact that the religion and control variables enter the equation with a lag of a five-year period as well as the fact that our findings are robust, even after controlling for many factors, is intriguing and suggests that the effects are likely to be causal.

As pointed out in section 1, our paper adds to the literature in several ways – most importantly by covering all major world religions, employing country-level rather than individual-level data and by using an exceptionally large sample of countries as well as a long sample period. Although we control for many factors and our results are robust, more research is needed. Most importantly, the ways in which the various world religions nowadays affect the demand for and the supply of schooling need to be systematically studied. Furthermore, the historical legacies of the various world religions need to be better disentangled from their contemporary ability to affect education.

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TABLE A1 *List of variables*

	Definition	Mean	Std. dev.	Min.	Max.	Source
	Dependent variables					
Secondary enrollment rate	Children enrolled in secondary education, regardless of age, as a percentage of the age group that officially corresponds to this level of education.	68.73	32.30	3.64	155.16	UNESCO Institute for Statistics (2015)
Female secondary enrollment rate	Girls enrolled in secondary education, regardless of age, as a percentage of girls in the age group that officially corresponds to this level of education.	68.16	34.34	2.16	168.65	UNESCO Institute for Statistics (2015)
Male secondary enrollment rate	Boys enrolled in secondary education, regardless of age, as a percentage of boys in the age group that officially corresponds to this level of education.	69.47	30.67	4.87	155.44	UNESCO Institute for Statistics (2015)
	Variables of interest					
Hinduism	Decimal fraction of the population adhering to Hinduism.	0.02	0.09	0.00	0.80	Maoz and Henderson (2013a)
Buddhism	Decimal fraction of the population adhering to Buddhism (including Shinto for Japan).	0.04	0.16	0.00	0.95	Maoz and Henderson (2013a)
Other Eastern religions	Decimal fraction of the population adhering to one of the following Eastern religions: Confucianism, Taoism, Jainism, Shinto (except for Japan) and Sikhism.	0.00	0.01	0.00	0.14	Maoz and Henderson (2013a)
Judaism	Decimal fraction of the population adhering to Judaism.	0.01	0.08	0.00	0.86	Maoz and Henderson (2013a)

TABLE A1 *List of variables* (cont.)

	Definition	Mean	Std. dev.	Min.	Max.	Source
Islam	Decimal fraction of the population adhering to Islam.	0.20	0.34	0.00	0.99	Maoz and Henderson (2013a)
Eastern Orthodoxy	Decimal fraction of the population adhering to Eastern Orthodox religion.	0.06	0.19	0.00	0.96	Maoz and Henderson (2013a)
Roman Catholicism	Decimal fraction of the population adhering to Roman Catholicism.	0.32	0.35	0.00	0.98	Maoz and Henderson (2013a)
Protestantism	Decimal fraction of the population adhering to Protestantism. This includes all churches and sects that can trace their roots back to the Protestant Reformation. Examples include Lutherans, Anglicans, Methodists and Pentecostals.	0.16	0.23	0.00	0.93	Maoz and Henderson (2013a)
	Control variables					
Public spending on education	Public spending on education as a decimal fraction of GDP. It consists of current and capital public expenditure on education and includes government spending on educational institutions (both public and private), education administration as well as subsidies for private entities (students/households and other private entities).	0.04	0.02	0.01	0.39	World Bank (2014)

Political rights & civil liberties	Average of political rights and civil liberties ratings. Political rights include the right to form political parties, to compete for public office and to elect representatives who have a decisive vote on public policies. Civil liberties include religious, ethnic, economic, linguistic, gender and family rights, personal freedoms and freedom of the press, belief and association. The index, which is based on surveys among analysts and academics, is scaled to range from 0 to 1, with higher values representing more political rights and civil liberties (or more respect for or more protection of political rights and civil liberties).	0.62	0.31	0.00	1.00	Freedom House (2014), author's calculations
Life expectancy	Life expectancy at birth in years.	66.08	10.32	32.11	82.11	World Bank (2014)
Death rate	Number of deaths per 1,000 people.	9.99	4.22	2.48	33.03	World Bank (2014)
Urbanization rate	People living in urban areas as a decimal fraction of the total population.	0.52	0.24	0.04	0.98	World Bank (2014)
GDP per capita	Expenditure side real GDP per capita at chained purchasing power parity rates, in tens of thousands of 2005 US dollars.	0.96	1.01	0.02	5.90	Feenstra et al. (2013), author's calculations
GDP growth rate	Annual growth rate of real GDP; decimal fraction.	0.04	0.03	−0.12	0.30	IMF (2014), World Bank (2014)
Private credit	The financial resources provided to the private sector by deposit money banks and other financial institutions as a decimal fraction of GDP. Domestic money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits.	0.41	0.38	0.00	2.13	World Bank (2013)

TABLE A1 *List of variables* (cont.)

	Definition	Mean	Std. dev.	Min.	Max.	Source
Physical capital stock	Real physical capital stock at constant 2005 national prices, in trillion 2005 US dollars.	0.87	3.01	0.00	37.55	Feenstra et al. (2013)
Openness	Sum of exports and imports of goods and services as a decimal fraction of GDP.	0.77	0.39	0.14	2.61	World Bank (2014)
Democracy	'Polity2' index, scaled to range from 0 (strongly autocratic) to 1 (strongly democratic). The index measures the degree of autocracy/democracy based on the competitiveness and regulation of political participation, the openness and competitiveness of executive recruitment and the constraints on the chief executive of the political regime.	0.66	0.35	0.00	1.00	Marshall et al. (2014)
Religious pluralism	One minus the Herfindahl index of religious group shares, reflecting the probability that two randomly selected individuals from a population belong to different groups.	0.29	0.19	0.02	0.70	Maoz and Henderson (2013a), author's calculations
Population growth rate	Annual growth rate of the population; decimal fraction.	0.02	0.01	−0.02	0.07	World Bank (2014)
Physical investment	Gross capital formation as a decimal fraction of GDP. It consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	0.23	0.07	0.04	0.69	World Bank (2014)
Inflation rate	Annual change in the consumer price index; decimal fraction.	0.40	2.66	−0.03	53.99	IMF (2014), World Bank (2014)

Systemic banking crises	Dummy variable that takes the value 1 if, in the respective year, the country experienced a systemic banking crisis. A banking crisis is defined as systemic if two conditions are met: first, significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system or bank liquidations) and second, significant banking policy intervention measures in response to significant losses in the banking system.	0.07	0.18	0.00	1.00	Laeven and Valencia (2013)
Natural disasters	Total number of persons affected by natural disasters as a decimal fraction of the population. Natural disasters include climate–related disasters (e.g., storms, floods and droughts), geological disasters (e.g., earthquakes, volcanic eruptions) and biological disasters (e.g., epidemics, insect infestations). For a disaster to be counted, it needs to meet at least one of the following criteria: 10 or more people reported killed, 100 or more people reported otherwise affected, a state of emergency was declared or a call for international assistance was issued. Total number of persons affected includes those killed, injured, homeless or requiring immediate assistance.	0.01	0.03	0.00	0.23	Centre for Research on the Epidemiology of Disasters – CRED (2014), World Bank (2014), author's calculations
Wars	Military and civilian deaths in battle–related conflicts, per 1,000 people.	0.01	0.04	0.00	0.70	World Bank (2014), author's calculations

List of Countries

Albania, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bhutan, Bolivia, Botswana, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Canada, Central African Republic, Chad, China, Colombia, Comoros, Costa Rica, Côte d'Ivoire, Croatia, Cyprus, Czech Republic, Democratic Republic of the Congo, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Grenada, Guatemala, Guinea, Guinea Bissau, Honduras, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Laos, Latvia, Lesotho, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Mali, Malta, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Republic of the Congo, Romania, Russia, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Saudi Arabia, Senegal, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Syria, Tajikistan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Zambia, Zimbabwe.